

# DATA SHEET

**ELECTROSTATIC DISCHARGE  
PROTECTION DEVICES**

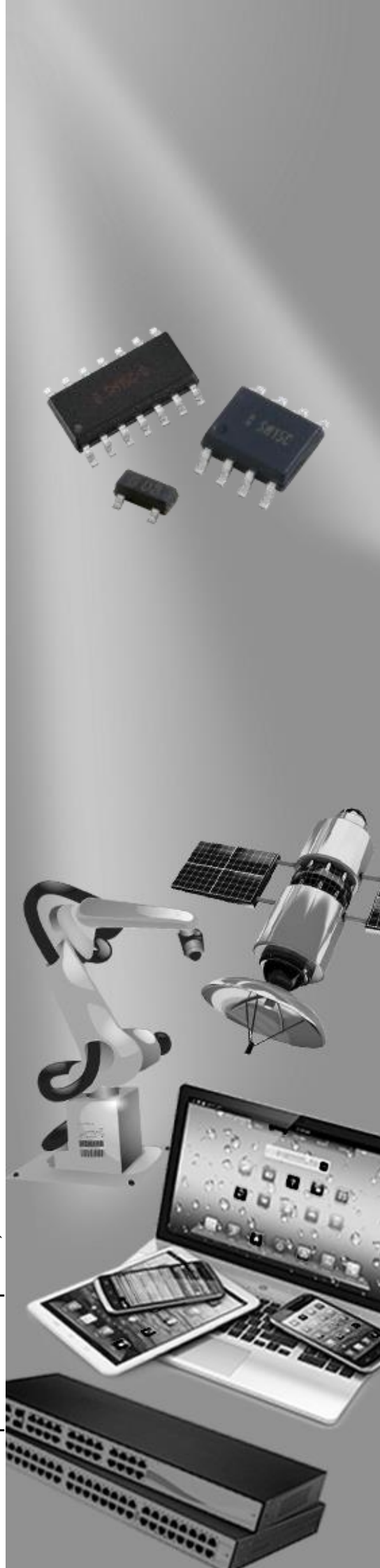
**INDUSTRIAL / CONSUMER**

LTS08AXXL02

RoHS compliant & Halogen free



Product specification – April 02, 2022 V.3



## Electrostatic Discharged Protection Devices (ESD) Data Sheet

### Description

Brightking's LTS08AXXL02 series transient voltage suppressor are designed to protect components which are connected to high speed data and telecommunication lines from voltage surges caused by electrostatic discharge (ESD), electrical fast transients (EFT), and lightning.

TVS diodes are ideal for use as board level protection of sensitive semiconductor components. The LTS08AxxL02 combine a TVS diode with a rectifier bridge to provide transient protection in both common and differential mode with a single device. The capacitance of the device in minimized (15pF) to ensure correct signal transmission on high speed lines. It meets the short-haul transient immunity requirements of Bellcore 1089 for telecommunications applications. Such as:

- Bellcore 1089 (intra-building) 100A (2/20 $\mu$ s)
- ITU K.20 I<sub>pp</sub>=40A (5/310 $\mu$ s)
- IEC61000-4-2 (ESD) 30KV (Air), 30KV (contact)
- IEC61000-4-4 (EFT) 40A (5/50ns)
- IEC61000-4-5 (Lightning) 100A (8/20 $\mu$ s)

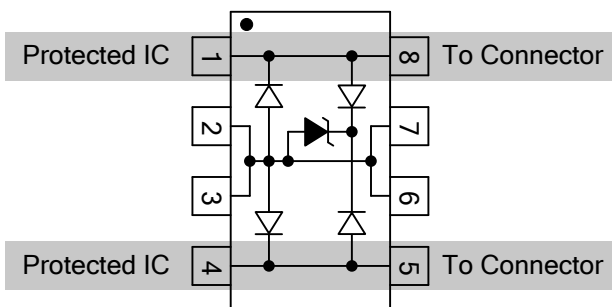
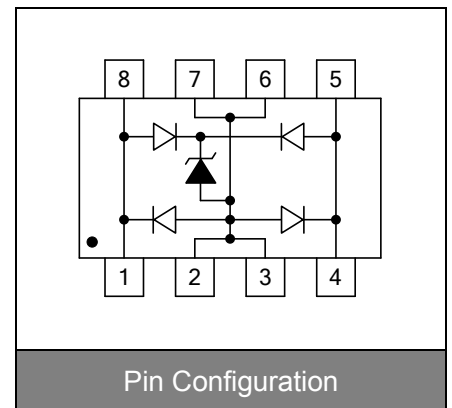


**Contact :  $\pm 30kV$**   
**Air :  $\pm 30kV$**

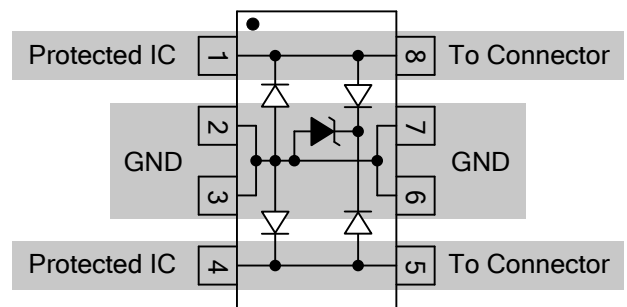


### Features

- IEC61000-4-2 ESD 30KV Air, 30KV contact compliance
- SOIC-08 surface mount package
- Protects two high-speed data lines
- Array of surge rated, low capacitance diodes
- Low clamping voltage
- Solid-state silicon avalanche technology
- Lead Free/RoHS compliant
- Solder reflow temperature: Pure Tin-Sn, 260~270 $^{\circ}C$
- Flammability rating UL 94V-0
- Meets MSL level 1, per J-STD-020



Protection --- Line to Line (Differential Mode)



Protection --- Line to GND (Common Mode)

## Maximum Ratings

| Rating                                  | Symbol                            | Value    | Unit |
|---|-----------------------------------|----------|------|
| Peak pulse power (tp=8/20μs waveform)   | P <sub>PP</sub>                   | 2000     | W    |
| Peak pulse current (tp=8/20μs waveform) | I <sub>PP</sub>                   | 100      | A    |
| ESD voltage (Contact discharge)         | V <sub>ESD</sub>                  | ±30      | kV   |
| ESD voltage (Air discharge)             |                                   | ±30      |      |
| Storage & operating temperature range   | T <sub>STG</sub> , T <sub>J</sub> | -55~+150 | °C   |

## Electrical Characteristics (T<sub>J</sub>=25°C)

LTS08A3.3L02 (Marking: B LC33 or LC03-3.3)

| Parameter  | Symbol           | Condition                               | Min. | Typ. | Max. | Unit |
|--|------------------|---|------|------|------|------|
| Reverse stand-off voltage                                      | V <sub>RWM</sub> |   |      |      | 3.3  | V    |
| Punch-Through voltage  | V <sub>PT</sub>  | I <sub>PT</sub> =1mA                    | 3.5  |      |      | V    |
| Snap-Back voltage  | V <sub>SB</sub>  | I <sub>SB</sub> =50mA                   | 2.8  |      |      | V    |
| Reverse leakage current  | I <sub>R</sub>   | V <sub>R</sub> =3.3V                    |      |      | 15   | μA   |
| Clamping voltage (tp=8/20μs)                                   | V <sub>C</sub>   | I <sub>PP</sub> =50A<br>Line to Ground  |      |      | 15   | V    |
| Clamping voltage (tp=8/20μs)                                   | V <sub>C</sub>   | I <sub>PP</sub> =50A<br>Line to Line    |      |      | 20   | V    |
| Clamping voltage (tp=8/20μs)                                   | V <sub>C</sub>   | I <sub>PP</sub> =100A<br>Line to Ground |      |      | 20   | V    |
| Clamping voltage (tp=8/20μs)                                   | V <sub>C</sub>   | I <sub>PP</sub> =100A<br>Line to Line   |      |      | 25   | V    |
| Off state junction capacitance<br>(V <sub>R</sub> =0V, f=1MHz) | C <sub>J</sub>   | Between I/O<br>pins and GND             |      | 15   | 30   | pF   |
|  |                  | Between I/O<br>pins                     |      | 12   | 30   | pF   |

### Typical Characteristics Curves

Figure 1. Power Derating Curve

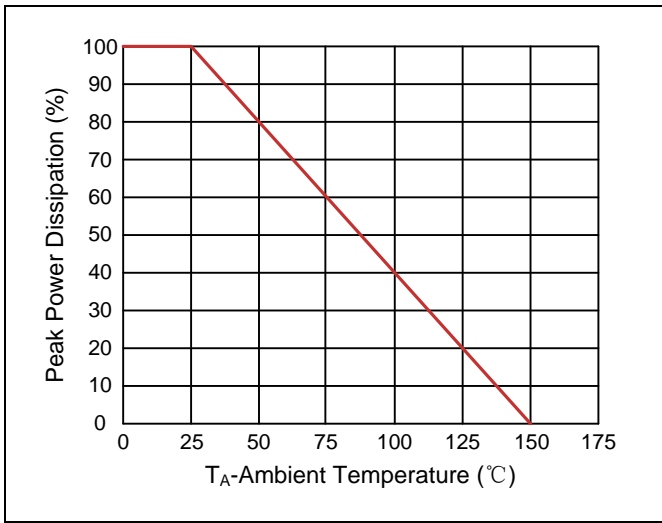


Figure 2. Pulse Waveforms

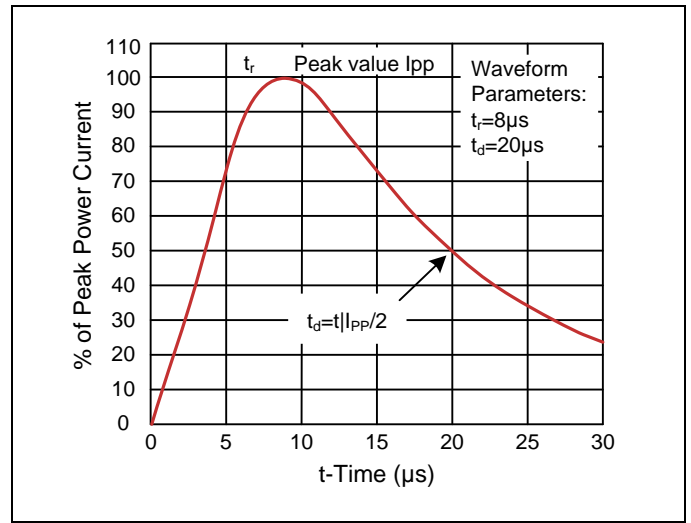


Figure 3. Non-Repetitive Peak Pulse vs. Pulse Time

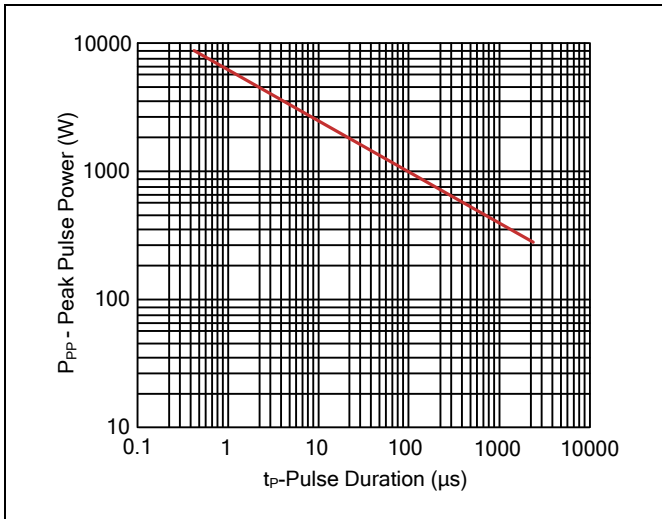


Figure 4. Capacitance vs. Reverse Voltage

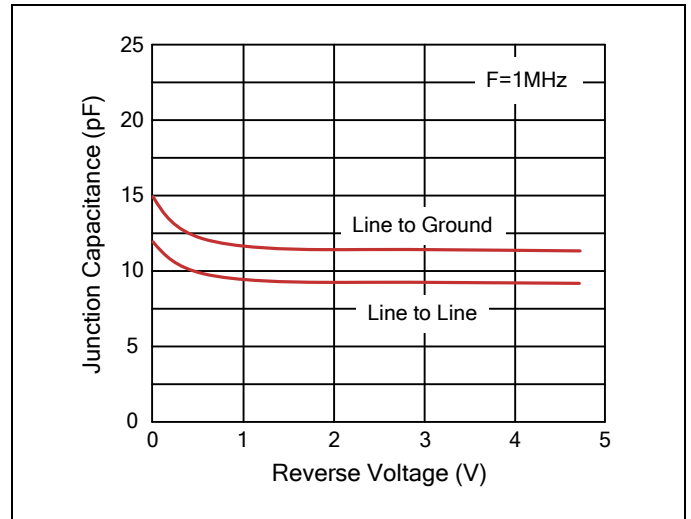
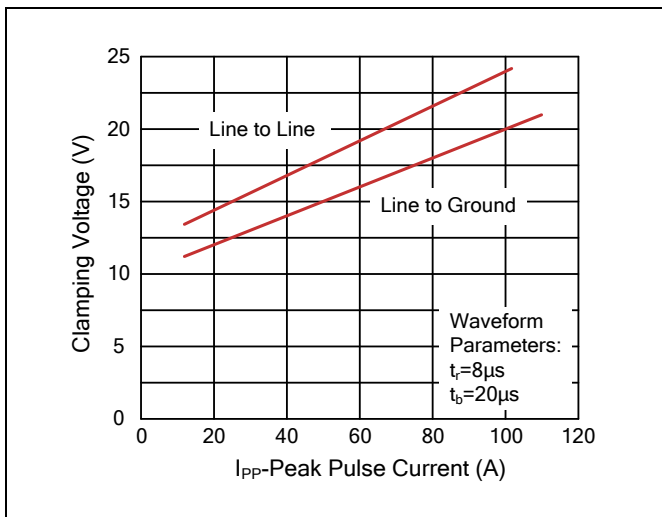
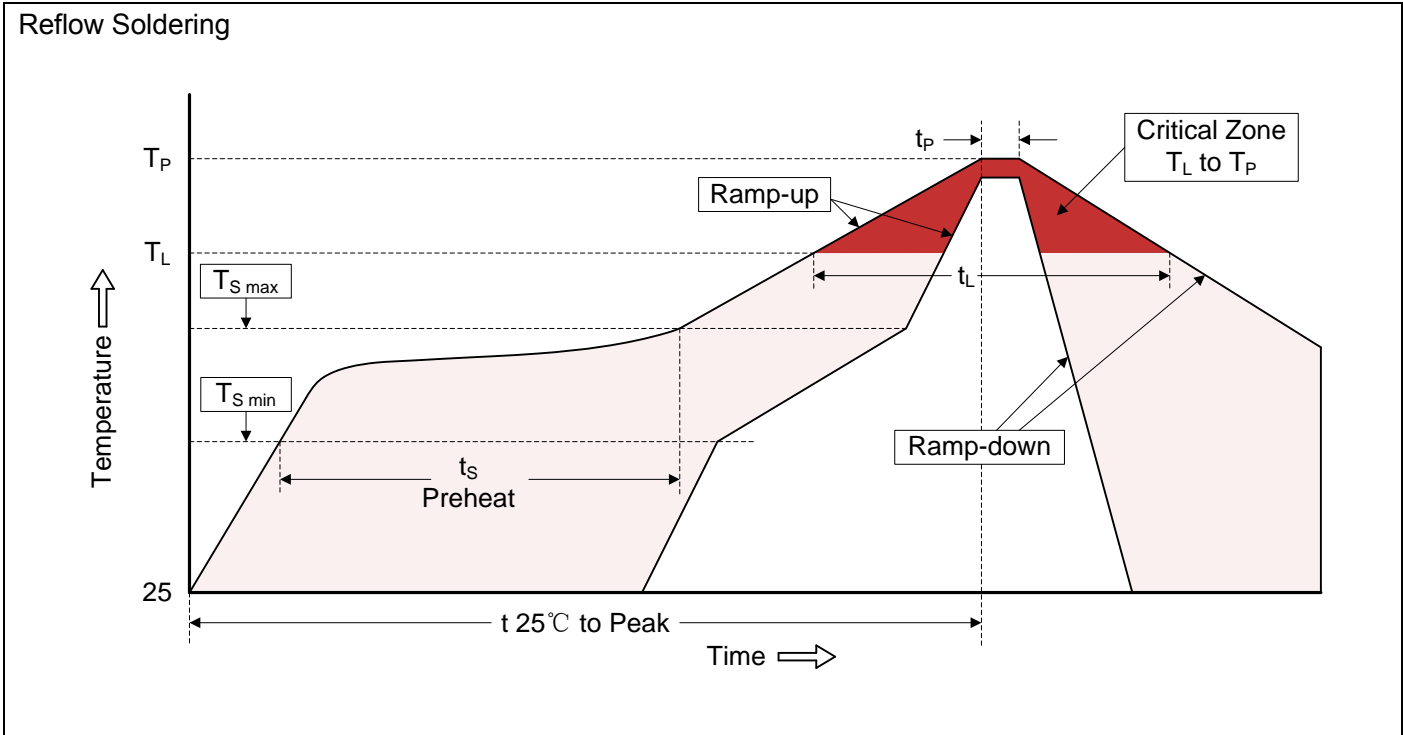


Figure 5. Clamping Voltage vs. Peak Pulse Current



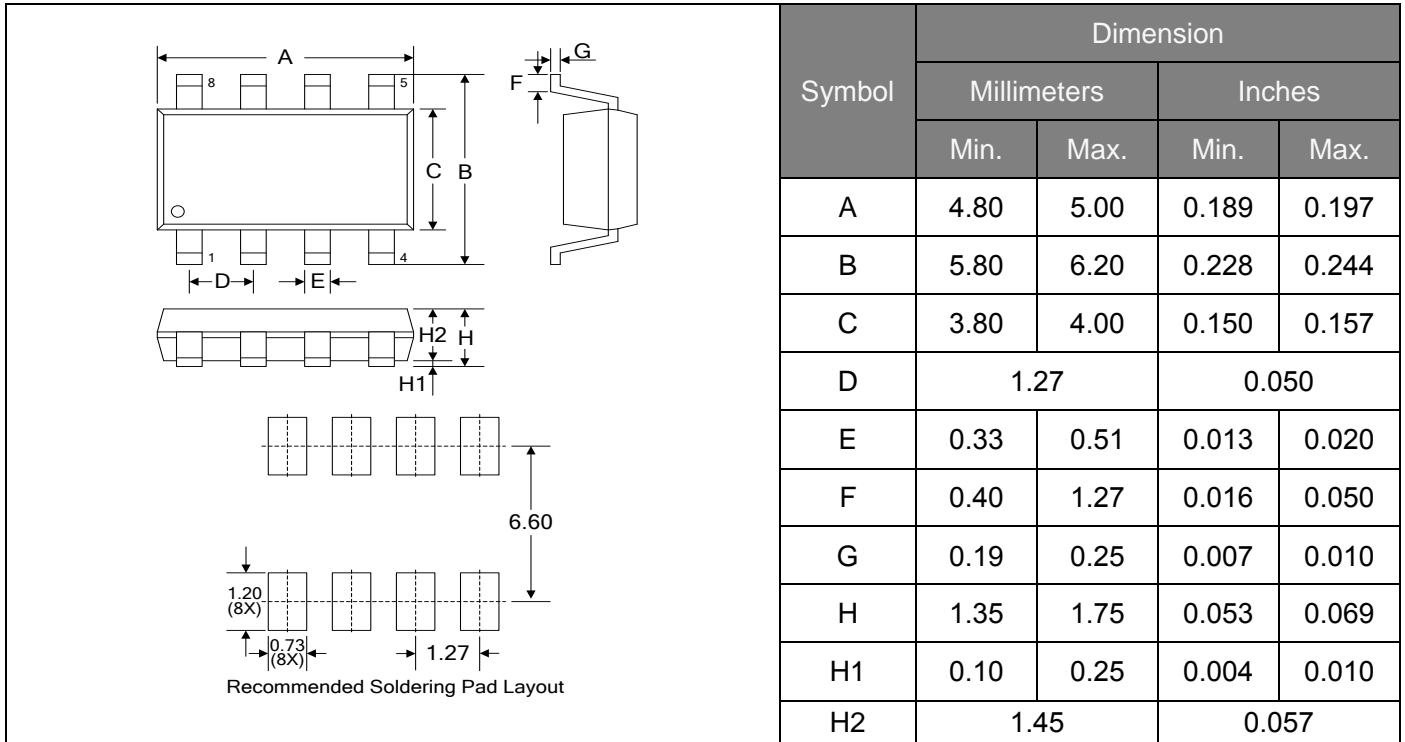
### Recommended Soldering Conditions



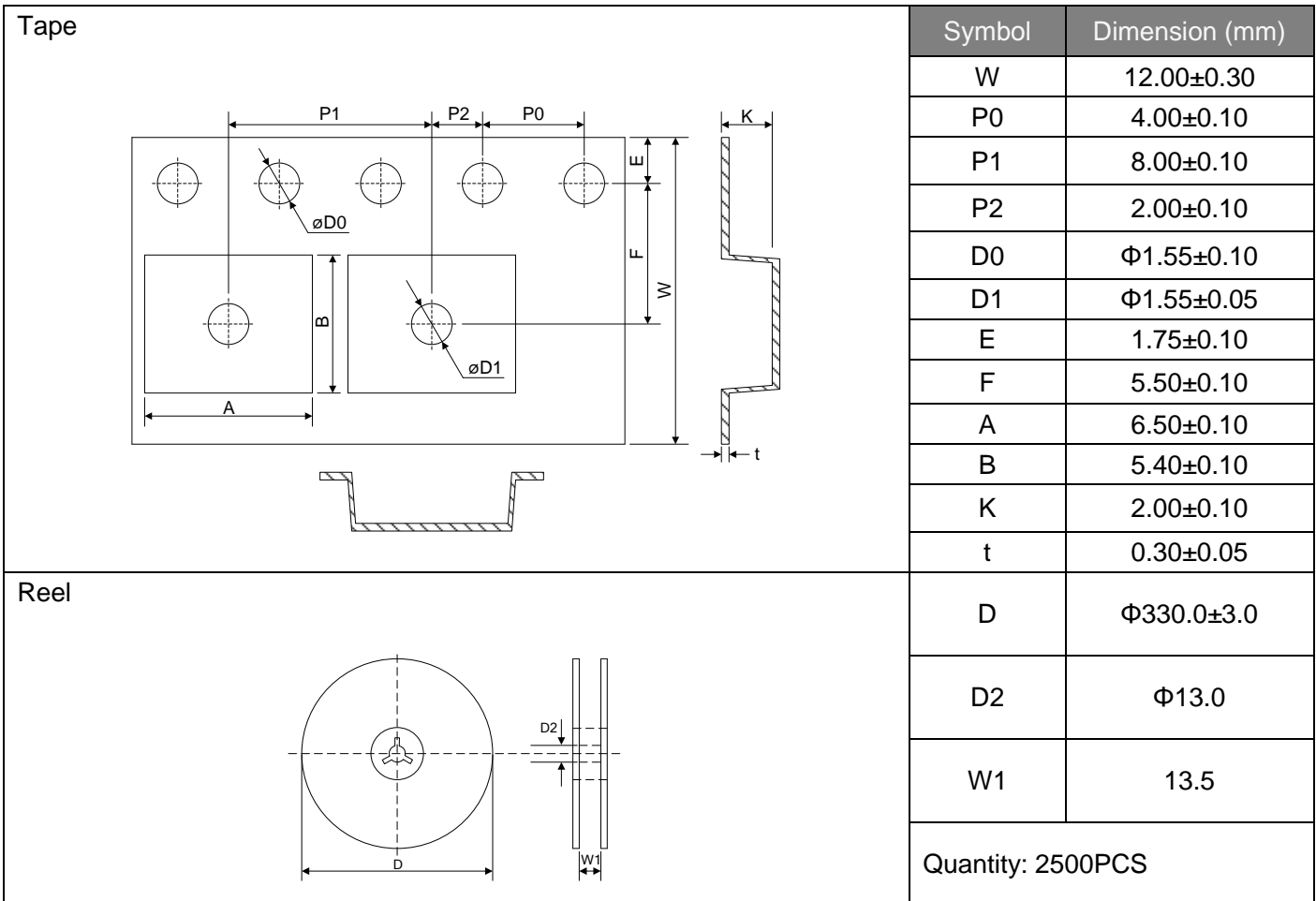
#### Recommended Conditions

| Profile Feature   | Pb-Free Assembly                 |
|---|----------------------------------|
| Average ramp-up rate ( $T_L$ to $T_P$ )   | 3°C/second max.                  |
| Preheat<br>-Temperature Min ( $T_{S\ min}$ )<br>-Temperature Max ( $T_{S\ max}$ )<br>-Time (min to max) ( $t_s$ ) | 150°C<br>200°C<br>60-180 seconds |
| $T_{S\ max}$ to $T_L$<br>-Ramp-up Rate  | 3°C/second max.                  |
| Time maintained above:<br>-Temperature ( $T_L$ )<br>-Time ( $t_L$ )   | 217°C<br>60-150 seconds          |
| Peak Temperature ( $T_P$ )  | 260°C                            |
| Time within 5°C of actual Peak Temperature ( $t_p$ )  | 20-40 seconds                    |
| Ramp-down Rate  | 6°C/second max.                  |
| Time 25°C to Peak Temperature   | 8 minutes max.                   |

**Dimensions (SOIC-08)**



**Packaging**



## LEGAL DISCLAIMER

YAGEO, its distributors and agents (collectively, "YAGEO"), hereby disclaims any and all liabilities for any errors, inaccuracies or incompleteness contained in any product related information, including but not limited to product specifications, datasheets, pictures and/or graphics. YAGEO may make changes, modifications and/or improvements to product related information at any time and without notice.

YAGEO makes no representation, warranty, and/or guarantee about the fitness of its products for any particular purpose or the continuing production of any of its products. To the maximum extent permitted by law, YAGEO disclaims (i) any and all liability arising out of the application or use of any YAGEO product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for a particular purpose, non-infringement and merchantability.

YAGEO products are designed for general purpose applications under normal operation and usage conditions. Please contact YAGEO for the applications listed below which require especially high reliability for the prevention of defects which might directly cause damage to the third party's life, body or property: Aerospace equipment (artificial satellite, rocket, etc.), Atomic energy-related equipment, Aviation equipment, Disaster prevention equipment, crime prevention equipment, Electric heating apparatus, burning equipment, Highly public information network equipment, data-processing equipment, Medical devices, Military equipment, Power generation control equipment, Safety equipment, Traffic signal equipment, Transportation equipment and Undersea equipment, or for any other application or use in which the failure of YAGEO products could result in personal injury or death, or serious property damage. Particularly **YAGEO Corporation and its affiliates do not recommend the use of commercial or automotive grade products for high reliability applications or manned space flight.**

Information provided here is intended to indicate product specifications only. YAGEO reserves all the rights for revising this content without further notification, as long as products are unchanged. Any product change will be announced by PCN.